

COMMONWEALTH OF PENNSYLVANIA
Department of Environmental Protection
Bureau of Air Quality
January 31, 2008

SUBJECT: Final Report
Award # XA – 83207301-0

TO: Paul Bubbosh
US EPA
Office of Transportation and Air Quality

FROM: Arleen Shulman
Chief, Mobile Sources Section
Bureau of Air Quality
Pennsylvania Department of Environmental Protection

Scope of Final Report. IdleAire has reported information to Pennsylvania on the following Advanced Truckstop Electrification sites: Carlisle, Cumberland County; Frystown, Berks County; Harborcreek, Erie County; and Greencastle, Franklin County. (Originally, the company intended to apply state funding to installation at four sites, but match limits led the company to use state funds at only three sites. (The Franklin County facility was not included in state assistance. Nevertheless, they continued to supply us with information on all four sites.)

All invoices have been paid under the EPA and Clean Air Fund (Energy Harvest) grants. We therefore consider this project to be complete. Emission reports provided to the Department for four sites (including the Carlisle site funded by this grant) are provided for your information attached to the e-mail transmitting this final report.

Summary of project

This grant contributed to the ability of Pennsylvania to realize the emission and energy-saving benefits of ATE at a Petro Stopping Center in Carlisle, Pennsylvania. Carlisle is located on I-81 and I-76, two interstates heavily traveled by freight carriers. The area has become a center of truck-related activity, including distribution centers, trucking companies, truck vendors and repair services as well as truck stops and other travel related services. While I-81 and I-76 cross, they do not have direct access to each other. The mile of state arterial highway between the two interchanges has become known as the “Miracle Mile” and is dominated by truck and travel service businesses. Petro #36 is located on the Miracle Mile.

There are currently nine operating IdleAire sites in Pennsylvania, according to IdleAire’s website at www.idleaire.com (choose locations and the December Excel spreadsheet for the most current list). Three were assisted by state funds totaling \$900,000 and the \$100,000 EPA grant for a total of \$1 million in public funds. IdleAire contributed approximately \$2.5 million for these three sites.

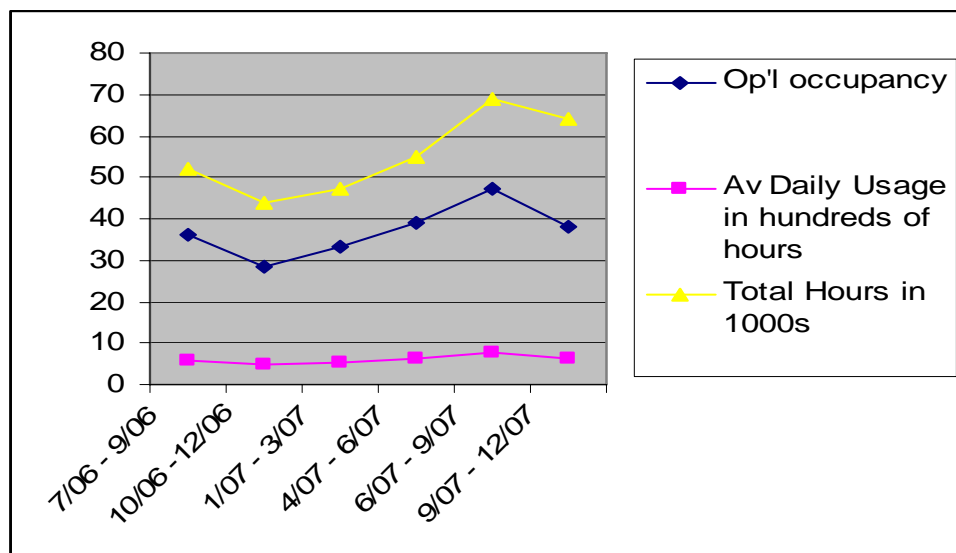
For the 72 ATE spaces in Carlisle, EPA provided 7% of the funds required for installation, Pennsylvania provided 19% and IdleAire provided 73%. Pennsylvania funds were a combination of Energy Harvest grants, a competitive grant program for energy efficiency to which (non-Title V) Clean Air Funds (fines and penalties) were contributed, and Alternative Fuel Incentive Grants, a competitive state-funded alternative fuel vehicle program.

Cost per space at Carlisle was identified by IdleAire as \$18,708. This was the most expensive of the four sites at which IdleAire has provided information. Costs at the other sites were around \$15,000 per space.

In addition, in order to boost utilization rates, the Commonwealth's Clean Air Fund provided a grant to IdleAire to make 4000 window adapters available free to drivers at four sites in nonattainment areas in order to increase usage. The promotion started mid-October 2006 and ended in April 2007. These adapters normally cost the driver \$10 and are necessary to fit the IdleAire unit into a truck window. IdleAire has reported that, at least for the month of comparison (mid-August to mid-September), operational occupancy increased by more than 50%.

Emission benefits

The Carlisle site became operational in June 2006. The chart below shows three of the usage statistics provided by IdleAire. The reporting period varies from 87 to 99 days in the quarter. Data has been rounded in order to show trends on the same chart.



Average stay in Carlisle is between 10 and 11 hours and is higher than the average stay than at other sites for which information is available.

IdleAire compared average number of trucks idling after the first 12 weeks of operation (time of their final report to us, required for full payment of invoices) to a four-day baseline survey and found that as opposed to a peak for about 225 trucks idling (between midnight and 1 A.M.), the

72 ATE spaces reduced the number of trucks idling by about 50. (Note: the months being compared are different.)

In its 18 months of operation, the ATE facility at Carlisle has reduced CO₂ by about 3450 *metric* tons and NO_x by about 45 metric tons, as well as made small reductions in particulate matter, carbon monoxide and volatile organic compounds.

See the charts provided for additional details.

Lessons learned

Usage rates assumed by IdleAire were overoptimistic. In its initial application for state funding, IdleAire used an assumption of 60% utilization rate and a stay of over 14 hours. In its final report, IdleAire stated that the utilization goal was 40%. Neither utilization rate goal has been realized consistently (over 365 days) yet at Carlisle, but for 2007, it's close at 36%. The average stay is considerably lower than originally estimated. The Carlisle site has been open longer than any other site in Pennsylvania and is the highest-performing of the four sites on which we have been provided information. Air-conditioning needs appear to be a bigger draw than heating or other needs to usage, which makes sense since bunk heaters are inexpensive. During the summer of 2007, utilization rate reached 47%. The initial length of stay projection by IdleAire appears to have been inaccurate for the trips that take place in Central Pennsylvania.

Installation difficulties were eventually resolved. IdleAire encountered some challenges at each of the four sites it has reported on, including site design, unexpected geology for drilling, flooding, and provision of electrical services. While DEP was prepared to assist IdleAire with infrastructure issues, this was never necessary. Setbacks were promptly addressed and caused very little delay in the commissioning dates. IdleAire's business plan, wherein the company only receives revenues from operating sites, provides incentives for rapid resolution without state involvement.

Funding streams for ATE projects are probably unique. The company found it a challenge to coordinate funding streams with different matching rates which were consistently lower than Congestion Mitigation and Air Quality funds. However, not having the involvement of PennDOT, a metropolitan planning organization and Federal Highways Administration undoubtedly streamlined the grant execution process. Because Pennsylvania's grants are reimbursement, we required IdleAire to itemize the items for which reimbursement was sought and get as close to the allowed grant without going over. Proof of payment to their vendors was also required for each item. This paperwork documentation caused some delay in payment to IdleAire while the information was compiled.

Related developments

Pennsylvania has provided small (\$7500 maximum) grants to many small trucking companies and owner/operators under its Small Business Advantage grant program for on-truck idling reduction systems. To date, it has awarded grants of \$994,000 to 185 grantees.

On January 12, 2008, the Pennsylvania Environmental Quality Board (EQB) proposed a statewide diesel commercial vehicle idling regulation based on a petition by the faith-based citizen group, Clean Air Board (CAB) of Central Pennsylvania based in Carlisle. After acceptance of the petition by the EQB, the Department studied truck idling in the Commonwealth and recommended development of a regulation. Hearings on the regulation will take place in mid-February 2008. In addition, it is possible that the Pennsylvania General Assembly will enact similar legislation. The department's proposed regulation is available at www.dep.state.pa.us/dep/deputate/airwaste/aq/cars/idling.htm

The proposed language includes an exemption that would not be available to trucks in a facility if an electrified parking space was available. The language was suggested by the petitioner. (The exemption for sleeper-equipped vehicles is proposed to expire in May 2010.)

The Pennsylvania Department of Transportation's State Transportation Advisory Committee recently completed a study of truck parking shortages in the state and integrated recommendations for addressing the effects of long-term idling into the report (December 2007).

Conclusions

The Commonwealth of Pennsylvania is pleased to have the nine operating IdleAire ATE sites as partners in reducing fuel use, energy independence, greenhouse gases and criteria pollutants from idling long-haul trucks. ATE can complement the on-truck technologies used by many companies to save fuel and reduce idling, particularly in reliably providing air conditioning and offering in-cab amenities.

However, ATE is probably the most expensive in cost per ton of the idling reduction technologies, which now will include the automatic shut-down systems required by California. Truckers also would like to have systems they can use anywhere, not just at truck stops, since this ability improves the economics of idling reduction. Pennsylvania, like many states, has a shortage of easily accessible truck parking in many areas, the I-81 corridor included.

With the fleet turnover, voluntary certification of clean idle main propulsion engines starting with model year 2008 by California and regulatory restrictions on idling time, the concerns raised by idling engines will primarily be fuel use. To the extent high diesel prices continue, the economics and amenities of IdleAire usage should not diminish.